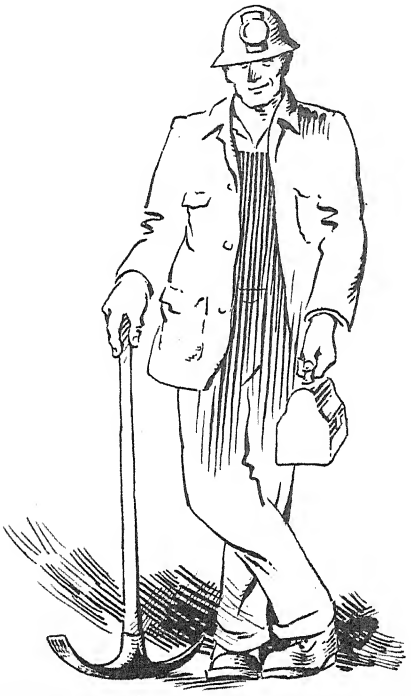
Uranium Miners

YOUR OUNCE OF PREVENTION



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Mines

Hazards exist in all types of jobs. But with proper controls, workers can earn their livelihood without injury to their health.

This booklet for miners and operator-owners points out a few facts about *occupational health* hazards in mines, particularly uranium mining. You may know or have heard about some of these hazards. Others you may or may not suspect. Finding out and taking the necessary precautions may add years to your life—healthy years. Here are some of the problems you are faced with and what you should be doing about them.

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Think you know all there is to know about mining, Mister??? It will take only a few minutes to read this. But it may save years of your life.

RADIATION

Radiation is something you cannot see, smell, taste, or feel. Once you breathe radioactive dust and gas into your lungs, some of it stays there. Some of it gets into your blood, is deposited into your bones. This takes time—maybe years.

Radon and its *daughter* products are the chief radiation hazard in uranium mines. Radon is a gas formed by the breakdown of radium in the uranium ore. It continuously oozes out of the ore body into the mine air and spreads through the workings. You breathe it along with the air.

In a short time, radon breaks down and changes into harmful *daughter* products. These are invisible radioactive particles.

The radioactive gas and dust you breathe is continually shooting off millions of tiny particles. Too much exposure to this dust and gas may produce lung cancer.

Radiation effects add up in you, like figures in an adding machine.

Scientists are working hard to get the final answer as to how much radon and its breakdown products, known as *daughters*, you can be exposed to safely. In the meantime, they have come up with some suggested figures for the amounts in the air you breathe. These amounts are called *working levels*. They represent the levels of exposure in which it is believed a man can work without detectable bodily injury.

Too much exposure to radioactive dusts and gases may cause lung cancer.

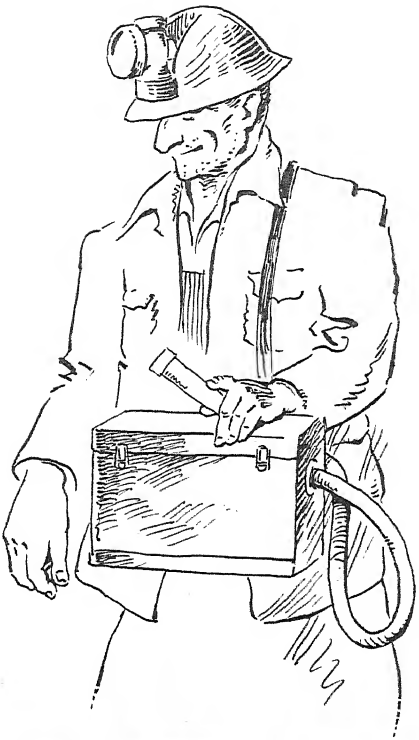
HOW TO REDUCE EXPOSURE TO RADIATION

★ Bring enough **clean, fresh** air to the face to sweep out the radon gas and dust. The radon *daughter* products adhere to the dust and are inhaled with it.

★ **Seal off** old workings. This will confine some of the radon that would otherwise get into the air you breathe.

★ **Keep clean.** Wash your hands and face before you eat. Take a shower often—after the shift, if you can. Wash your diggers often.

★ **Drill wet.** This helps keep radioactive dust particles down.



Remember!

You cannot see, smell, feel, or otherwise detect radon gas or its radiations without special instruments. Suitable instruments are required to measure these air contaminants in your mine. This is the only way to make sure that your ventilation system is supplying enough fresh air to the right places.

GASES

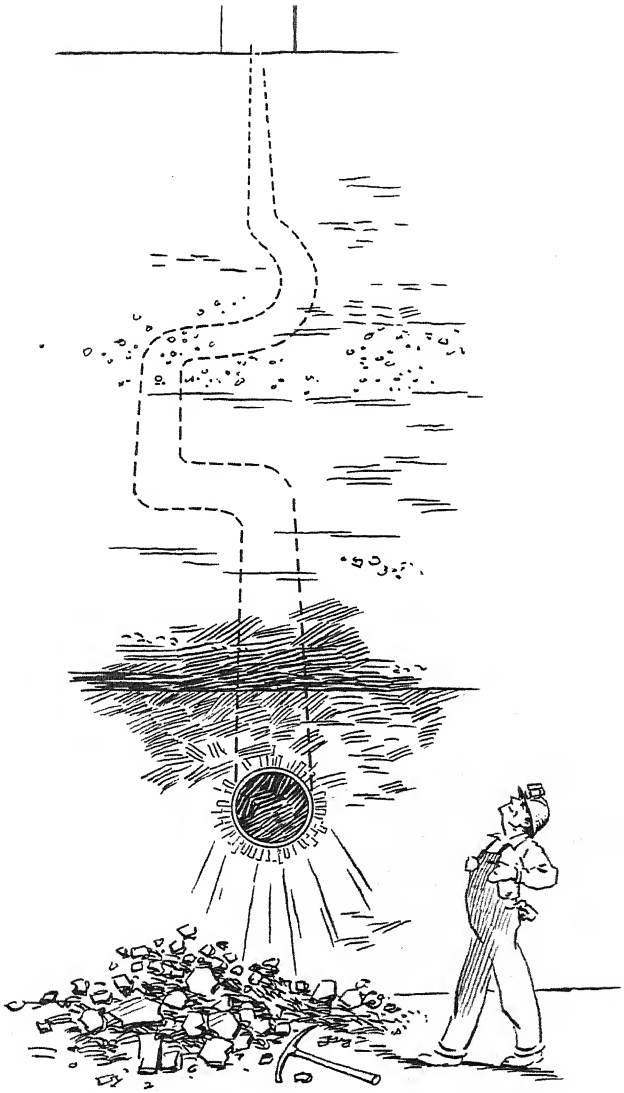
Not all gases are harmful, but some can spell trouble for you. In addition to radon, here are some dangerous gases and conditions you should know about and watch out for:

Oxides of nitrogen have a *burned-powder* odor and often a reddish color. They irritate the lungs. Even a small amount can result in serious illness which may be fatal. The best safeguard is to stay out of a stope or other working place right after a blast. Let it air out.

Carbon monoxide is a colorless, odorless, and tasteless gas. It is poisonous in very small amounts. This hazard can be avoided by pouring plenty of fresh air into the mine. Do not go back to any working area right after a blast. Let it air out.

Carbon dioxide likewise cannot be seen or smelled in the mine atmosphere. But it can lower your efficiency and endanger your life. A little too much makes you breathe more rapidly. Greater quantities can knock you unconscious and even kill you.

Oxygen deficiency exists when the oxygen in he air is greatly reduced and no fresh air comes n to take its place. When the amount of oxygen ı the air drops, your brain and your judgment re affected. Lack of oxygen can also cause suf- ocation. A man entering an area with very little xygen can be knocked out forever, immediately ıd without warning. Don't go into unused or nventilated workings without using a candle or ine safety lamp to test the air. Don't stay in a lace where a candle or mine safety lamp will not burn. A carbide light will burn in air that is harmful to you.



Air it out. Pour in fresh, outside air.

SILICOSIS

Silicosis is caused by breathing silica dust. This dust is found in most metal mines.

Two things are important in getting—or not getting—silicosis:

The amount of dust in the air you breathe

How long you've been breathing it

Silicosis thickens lung tissue and makes it less elastic. It causes shortness of breath, pains in the chest. You may start coughing up mucus. start getting weaker and weaker. Pretty soon you can't lug that drill around so well any more, and you are a first class target for tuberculosis.

To Help Prevent Silicosis

★ **Drill wet** or use a dust collector.
★ Ventilate the mine.
★ Wet down the muck piles.
★ Keep the haulageways wet down.
★ Do not return to working place until dust has settled after blasting.

"Getting rocked up is no picnic."

ARE CONTROLS WORTH IT?

To ventilate the mine properly, to pump or haul in extra water for wetting down, to seal off old, abandoned workings in order to keep radon emission to a minimum, and to follow the other recommendations means time, effort, and expense. The cooperation of both the owner-operator and the miner is essential in maintaining safe working conditions. But look at it like this:

Mining is the miner's livelihood. He should not consider working under hazardous conditions in a mine as being any different—or safer—than driving a truck with bad brakes. Disability compensation is a wonderful thing as far as it goes. But it can't fully compensate the miner or his family if he is disabled.

The mine is a source of income for the owner-operator as well as for the miner. The prime concern of both is the largest net income possible. This flow of income cannot be assured in a dangerous environment. Thus, aside from the responsibility of the owner-operator to his employees, it is simply good practice to provide the best feasible working conditions.

A FEW LAST TIPS

★ Keep that dust down.

★ Keep fresh clean air pouring in—to where *you* are working.

★ Use internal combustion engines underground only if approved. Use them under approved conditions.

A special word to owner-operators. Do not hesitate to ask for advice. Some of the people who can help you are →

→ State mine inspectors

→ State health departments

→ On the Navajo reservation, the Tribal Council's mining engineers

→ U.S. Bureau of Mines, Health and Safety Activities, Denver Federal Center, Denver, Colorado; Phoenix, Arizona; Seattle, Washington; Salt Lake City, Utah; and San Francisco, California

→ U.S. Department of Health, Education, and Welfare
Public Health Service
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